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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/675,548

09/28/2000

Jyri Paavola

2072-00050

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06/04/2004

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EXAMINER

VILLECCO, JOHN M

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/675,548

Applicant(s)

PAAVOLA ET AL.

Examiner

John M. Villecco

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 1-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The disclosure is objected to because of the following informalities:
  - On page 7, line 6 of the specification applicant refers to the conveyor belt as reference number 16. However, in the drawings the conveyor belt is given the reference number 20.

Appropriate correction is required.

### *Claim Objections*

3. Claims 1-10 are objected to because of the following informalities:
  - Regarding claims 1-10, applicant uses the word “characterized”. This appears to be a typographical error and that the applicant meant to use the word – characterized–.
  - In claim 1, line 12, applicant uses the phrase “also comprise”. This also appears to be a typographical error and that the applicant meant to use the phrase – also comprises –.
  - In claim 3, line 2 applicant recites the phrase “strip-like mirror (5)”. However is not clear which mirror is being discussed. Both the parabolic mirror and the

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plane mirror are “strip-like”. For examination purposes it will be assumed that the applicant meant to use the phrase – strip-like plane mirror (5) –.

- In claim 4, line 3 applicant uses the notation “°C”, indicating that the angle is at a maximum 30 degrees Celsius. This appears to be a typographical error and that the applicant meant to only use the symbol “°”.
- In claim 8, line 1, applicant makes mention of “said transverse distance (P2)”. Claim 8 is dependent upon claim 5, and claim 5 (or claim 1, from which 5 depends) mentions nothing about a transverse distance (P2). Based on this, it appears that the applicant meant to depend claim 8 upon claim 7

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 2, 5-7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rydningen (U.S. Patent No. 5,680,219) in view of Luster (U.S. Patent No. 6,324,016).**

6. Regarding *claim 1*, Rydningen discloses an apparatus for measuring the thickness of sawn timber. The apparatus includes a non-telecentric camera (5) which inherently includes an objective and an image plane, a concave strip mirror (3), and light sources (1 and 2). The concave mirror is substantially aligned with the camera and the aperture of the objective. This

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arrangement is used to capture an image of the timber passing through and to obtain a thickness measurement of the boards being cut with a saw. See column 1, line 61 to column 2, line 14 and column 3, lines 5-55.

Rydningen, however, fails to specifically disclose the imager consisting of a row of photosensitive cells, or a strip-like plane mirror between the parabolic mirror and the camera objective. Luster, on the other hand discloses a telecentric lens system that uses a concave mirror in an off-axis manner to avoid blockage of a portion of the field of view. More specifically, Luster discloses a telecentric imaging system which includes a parabolic mirror (70) for forming a quality image. Luster discloses that the telecentric optical system can be used for a linear array. The use of a linear array allows for reduced off-axis angles (col. 5, lines 7-21). Additionally, Luster discloses that the optical system can include plane mirrors to fold the optical path and reduce overall size of the telecentric lens system (col. 5, lines 22-38). It is well known in the art that telecentric lens systems are optimal in dimensional imaging since an image is formed in which the object appears to be a consistent size regardless of its position in the field of view. Therefore, it would have been obvious to one of ordinary skill in art to use a telecentric imaging system in the device of Rydningen in order to form an image optimal for dimensional imaging. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a linear image sensor and plane mirrors in order to reduce the off axis angle and to reduce the overall size of the imaging system without affecting the performance.

7. Regarding *claim 2*, Luster discloses the use of a plane mirror to deflect the light from the concave mirror. Obviously, one of ordinary skill in the art would align the lengths of the two

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mirrors and the imager so that a complete image may be formed. Furthermore it is inherently that the reflective planes of the two mirrors are directed toward each other since this is the only way to direct light from one place to another. Furthermore, the image direct from one mirror to the other would be indicative of the width of the mirror and would be directed at predetermined angles.

8. With regard to *claim 5*, Rydningen discloses that the mirrors (3 and 4) are substantially greater in length than in width and both are longer than the width of the object being measured.

9. As for *claim 6*, neither Rydningen nor Luster specifically discloses that the surface of the mirrors is metal. However, Official Notice is taken as to the fact that metal is commonly used to form the reflective surface of mirrors. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use metal as the reflective surface of the mirrors since it is such a common way of forming mirrors.

10. Regarding *claim 7*, Rydningen discloses the use of light sources (1 and 2) for directing the light towards the object. Inherently, the light is a scattered light source that is independent of the imaging means. The light is located adjacent to the imaging means at a distance which is transverse to the direction of movement of the radiation.

11. With regard to *claim 9*, Rydningen discloses an apparatus for measuring the thickness of sawn timber. The apparatus includes a non-telecentric camera (5) which inherently includes an objective and an image plane, a concave strip mirror (3), and light sources (1 and 2). The concave mirror is substantially aligned with the camera and the aperture of the objective. This arrangement is used to capture an image of the timber passing through and to obtain a thickness

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measurement of the boards being cut with a saw. See column 1, line 61 to column 2, line 14 and column 3, lines 5-55. The timber moves in a direction perpendicular to the camera.

Rydningen, however, fails to specifically disclose the imager consisting of a row of photosensitive cells, or a plane mirror between the parabolic mirror and the camera. Luster, on the other hand discloses a telecentric lens system that uses a concave mirror in an off-axis manner to avoid blockage of a portion of the field of view. More specifically, Luster discloses a telecentric imaging system which includes a parabolic mirror (70) for forming a quality image. Luster discloses that the telecentric optical system can be used for a linear array. The use of a linear array allows for reduced off-axis angles (col. 5, lines 7-21). Additionally, Luster discloses that the optical system can include plane mirrors to fold the optical path and reduce overall size of the telecentric lens system (col. 5, lines 22-38). It is well known in the art that telecentric lens systems are optimal in dimensional imaging since an image is formed in which the object appears to be a consistent size regardless of its position in the field of view. Therefore, it would have been obvious to one of ordinary skill in art to use a telecentric imaging system in the device of Rydningen in order to form an image optimal for dimensional imaging. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a linear image sensor and plane mirrors in order to reduce the off axis angle and to reduce the overall size of the imaging system without affecting the performance.

12. As for *claim 10*, Rydningen discloses that the object is timber and is moved through the apparatus. Although, Rydningen fails to specifically disclose how the timber is moved, one of ordinary skill in the art would have found it obvious to move the timber using a chassis base.

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Official Notice is taken as to the fact that it is well known to transport timber using a chassis base. Furthermore, the timber is cut into strips (See Fig. 1 and 2B).

*Allowable Subject Matter*

13. Claims 3, 4, 8, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

Regarding *claim 3*, the primary reason for indication of allowable subject matter is that the prior art fails to teach or reasonably suggest that the distance of the mirror from the camera objective is at least 1.5 times the distance of the parabolic mirror from the objective and that the plane mirror and the parabolic mirror are mutually spaced by a distance perpendicular to their length, the distance being at least equal to half of the combined width ( $W1 + W2$ ) of these mirrors and at the most 5 times the combined width ( $W1 + W2$ ) of these mirrors.

As for *claim 4*, the primary reason for indication of allowable subject matter is that the prior art fails to teach or reasonably suggest that the normal to the reflective surface of the parabolic mirror is at a maximum 30 degrees relative to the normal to the object, and that the angle between the normals to the reflective surfaces of the parabolic mirror and the plane mirror is 30 degrees at the most.

With regard to *claim 8*, the primary reason for indication of allowable subject matter is that the prior art fails to teach or reasonably suggest that the transverse distance of the scattered



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light source is smaller than the distance between the parabolic mirror and the object and that the scattered light source is spaced over the width of the object parallel with the length of the parabolic mirror.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (For either formal or informal communications intended for entry. For informal or draft communications, please label **"PROPOSED"** or **"DRAFT"**)

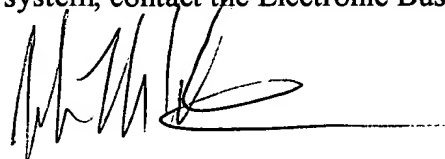
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington VA, Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John M. Villecco whose telephone number is (703) 305-1460. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John M. Villecco

May 20, 2004



WENDY R. GARBER  
SUPERVISORY PATENT EXAMINER  
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